

What is Claimed:

1 1. A method for use in a communication system utilizing multiple bands
2 to improve error rates in the transmission of a data stream to a receiver, the method
3 comprising the steps of:

4 mapping a bit stream within the data stream to a first band of the multiple
5 bands;

6 mapping the bit stream to a second band of the multiple bands, wherein the
7 first and second bands are non-overlapping; and

8 transmitting the bit stream in the first band and the bit stream in the second
9 band for receipt by the receiver.

1 2. The method of claim 1, wherein the method is for use in an Ultra
2 Wideband (UWB) communication system which utilizes a plurality of UWB multi-bands and
3 wherein the transmitting step comprises the steps of:

4 transmitting the bit stream in the first band via a first UWB multi-band of
5 the plurality of UWB multi-bands and the bit stream in the second band via a second UWB
6 multi-band of the plurality of UWB multi-bands.

1 3. The method of claim 1, further comprising the step of:

2 receiving a received error indicator corresponding to the bit stream in the
3 first band, wherein the bit stream is mapped to the second band and transmitted in the
4 second band only responsive to receipt of the received error indicator.

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1 4. The method of claim 1, wherein the transmitting step comprises the
2 step of:

3 transmitting the bit stream in the first band and the second band
4 substantially concurrently.

1 5. The method of claim 1, wherein the bit stream is mapped to the first
2 band in a frame time and wherein the step of mapping the bit stream to the second band
3 comprises the steps of:

4 mapping the bit stream to the second band in the same frame time as the
5 bit stream in the first band.

1 6. The method of claim 1, wherein the bit stream is mapped to the first
2 band in a frame time and wherein the step of mapping the bit stream to the second band
3 comprises the steps of:

4 mapping the bit stream to the second band in a subsequent frame time to
5 the frame time in which the bit stream is mapped to the first band.

1 7. A method for use in a communication system utilizing multiple bands
2 to improve error rates in a data stream received from a transmitter, the transmitter
3 capable of mapping a portion of an input bit stream of a data stream to a first band of the
4 multiple bands and the portion of the input bit stream to a second band of the multiple
5 bands, the method comprising the steps of:

6 receiving a bit stream in the first band and an other bit stream in the second
7 band, the received bit streams corresponding to the portion of the input bit stream;

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8 demapping the first band including the received bit stream to obtain a first
9 band bit stream corresponding to the input bit stream;

10 demapping the second band including the other bit stream to obtain a
11 second band bit stream corresponding to the second bit stream; and

12 processing the first and second band bit streams to yield the portion of the
13 input bit stream.

1 8. The method of claim 7, wherein the first and second band bit streams
2 each include symbols and wherein the processing step comprises the step of:

3 combining symbols in the first band bit stream with corresponding symbols
4 in the second band bit stream; and

5 processing the combined symbols to yield the portion of the input bit
6 stream.

1 9. The method of claim 7, wherein the transmitter is configured to map
2 the portion of the input bit stream to the second band responsive to an error detection
3 signal and wherein the method further comprises the steps of:

4 detecting errors in the first band; and

5 generating the error detection signal for receipt by the transmitter
6 responsive to the detected errors.

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1 10. An apparatus for use in a communication system utilizing multiple
2 bands to improve error rates in the transmission of a data stream to a receiver, the
3 apparatus comprising:

4 a mapper configured to map a bit stream within the data stream to a first
5 band of the multiple bands and to map the bit stream to a second band of the multiple
6 bands, wherein the first and second bands are non-overlapping; and

7 a transmitter coupled to the mapper, the transmitter configured to transmit
8 the bit stream in the first band and the bit stream in the second band for receipt by the
9 receiver.

1 11. The apparatus of claim 10, wherein the transmitter is an Ultra
2 Wideband (UWB) multi-band transmitter.

1 12. The apparatus of claim 10, wherein the mapper is further configured
2 to receive a received error indicator corresponding to the bit stream in the first band and
3 wherein the mapper only maps the bit stream to the second band for transmission by the
4 transmitter responsive to receipt of the received error indicator.

1 13. The apparatus of claim 10, wherein the mapper is configured to map
2 the bit stream to the first band in a frame time and to map the bit stream to the second
3 band in the same frame time as the bit stream in the first band.

1 14. The apparatus of claim 10, wherein the mapper is configured to map
2 the bit stream to the first band in a frame time and to map the bit stream to the second

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3 band in a subsequent frame time to the frame time in which the bit stream is mapped to
4 the first band.

1 15. An apparatus for use in a communication system utilizing multiple
2 bands to improve the reception of a data stream from a transmitter, the transmitter
3 capable of mapping a portion of an input bit stream of a data stream to a first band of the
4 multiple bands and the portion of the input bit stream to a second band of the multiple
5 bands, the method comprising the steps of:

6 a receiver configured to receive a bit stream corresponding to the portion of
7 the input bit stream in the first band and an other bits stream corresponding to the portion
8 of the input bit stream in the second band;

9 a demapper coupled to the receiver, the demapper configured to demap the
10 first band to obtain a first band bit stream corresponding to the bit stream and to demap
11 the second band to obtain a second band bit stream corresponding to the first band bit
12 stream; and

13 a processor coupled to the demapper, the processor configured to process
14 the first and second band bit streams to yield the portion of the input bit stream.

1 16. The apparatus of claim 15, wherein the first and second input bit
2 streams each include symbols and wherein the processor is further configured to combine
3 symbols in the first input bit stream with corresponding symbols in the second input bit
4 stream and to process the first and second input bit streams to yield the portion of the
5 input bit stream.

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1 17. The apparatus of claim 16, wherein the transmitter maps the portion
2 of the input bit stream to the second band responsive to an error detection signal and
3 wherein the processor is further configured to detect errors in the first band and to
4 generate the error detection signal for receipt by the transmitter responsive to the
5 detected error.

1 18. A system for use in a communication system utilizing multiple bands
2 to improve error rates in the transmission of a data stream to a receiver, the system
3 comprising:

4 means for mapping a bit stream within the data stream to a first band of the
5 multiple bands;

6 means for mapping the bit stream to a second band of the multiple bands,
7 wherein the first and second bands are non-overlapping; and

8 means for transmitting the bit stream in the first band and the bit stream in
9 the second band for receipt by the receiver.

1 19. The system of claim 18, further comprising:

2 means for receiving a received error indicator corresponding to the bit
3 stream in the first band, wherein the bit stream is mapped to the second band and
4 transmitted in the second band only responsive to receipt of the received error indicator.

1 20. A system for use in a communication system utilizing multiple bands
2 to improve error rates in a data stream received from a transmitter, the transmitter
3 capable of mapping a portion of an input bit stream of a data stream to a first band of the

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4 multiple bands and the portion of the input bit stream to a second band of the multiple
5 bands, the system comprising:

6 means for receiving a bit stream in the first band and an other bit stream in
7 the second band, the received bit streams corresponding to the portion of the input bit
8 stream;

9 means for demapping the first band including the received bit stream to
10 obtain a first band bit stream corresponding to the input bit stream;

11 means for demapping the second band including the other bit stream to
12 obtain a second band bit stream corresponding to the second bit stream; and

13 means for processing the first and second band bit streams to yield the
14 portion of the input bit stream.

1 21. The system of claim 20, wherein the means for processing comprises:

2 means for combining symbols in the first band bit stream with corresponding
3 symbols in the second band bit stream; and

4 means for processing the combined symbols to yield the portion of the input
5 bit stream.

1 22. The system of claim 21, wherein the transmitter is configured to map
2 the portion of the input bit stream to the second band responsive to an error detection
3 signal and wherein the system further comprises:

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4 means for detecting errors in the first band; and

5 means for generating the error detection signal for receipt by the transmitter
6 responsive to the detected errors.

1 23. A computer readable carrier including software that is configured to
2 control a computer to implement a multi-band ultra wideband signal processing method
3 embodied in a computer readable medium to improve error rates in the transmission of a
4 data stream to a receiver, the method including the steps of:

5 mapping a bit stream within the data stream to a first band of the multiple
6 bands;

7 mapping the bit stream to a second band of the multiple bands, wherein the
8 first and second bands are non-overlapping; and

9 transmitting the bit stream in the first band and the bit stream in the second
10 band for receipt by the receiver.

1 24. The computer readable carrier of claim 23, wherein the method
2 implemented by the computer further includes the step of:

3 receiving a received error indicator corresponding to the bit stream in the
4 first band, wherein the bit stream is mapped to the second band and transmitted in the
5 second band only responsive to receipt of the received error indicator.

1 25. A computer readable carrier including software that is configured to
2 control a computer to implement a multi-band ultra wideband signal processing method

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embodied in a computer readable medium to improve error rates in a data stream received from a transmitter, the transmitter capable of mapping a portion of an input bit stream of a data stream to a first band of the multiple bands and the portion of the input bit stream to a second band of the multiple bands, the processing method including the steps of:

receiving a bit stream in the first band and an other bit stream in the second band, the received bit streams corresponding to the portion of the input bit stream;

demapping the first band including the received bit stream to obtain a first band bit stream corresponding to the input bit stream;

demapping the second band including the other bit stream to obtain a second band bit stream corresponding to the second bit stream; and

processing the first and second band bit streams to yield the portion of the input bit stream.

26. The computer readable carrier of claim 25, wherein the processing step for implementation by the computer comprises the steps of:

combining symbols in the first band bit stream with corresponding symbols in the second band bit stream; and

processing the combined symbols to yield the portion of the input bit stream.

27. The computer readable carrier of claim 26, wherein the transmitter is configured to map the portion of the input bit stream to the second band responsive to an

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3 error detection signal and wherein the method implemented by the computer further
4 includes the step of:

5 detecting errors in the first band; and

6 generating the error detection signal for receipt by the transmitter
7 responsive to the detected errors.